

Learnability in the Acquisition of Multiple Senses: SOURCE
Reconsidered

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Learnability in the acquisition of multiple senses:

SOURCE reconsidered

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1. Introduction

This paper explores a novel connection between learnability theory and semantic acquisition, with a focus on the issue of polysemy. It argues that the *Subset Principle* (Berwick 1985), along with certain empirical observations about sense extensions by children, supports a view of the acquisition of polysemy called the *Conflation Hypothesis* (Johnson to appear). According to this view, some polysemous forms are initially associated by children with representations of prototypical scenes that combine or *conflate* notions relevant to more than one adult sense, and these conflated representations serve as the basis for the learning of the distinct adult senses.

The Conflation Hypothesis is briefly illustrated with data from Johnson (to appear), and its relation to learnability issues is examined with reference to Clark and Carpenter 1991 (hereafter C&C), which contains important observations about the preposition *from*, the range of senses exhibited by it in English (and by similar forms crosslinguistically), and the novel uses to which children put it. Besides what C&C call its Locative sense¹, as in *He knocked the butter from the table*, *from* also has a Temporal sense, as in *from now until four o'clock*, a Causal sense, as in *to collapse from a heart attack*, and a number of other senses in adult usage. In addition to these, children sometimes produce novel uses of *from* with an apparent Agentive sense, as in *He isn't going to get hurt from those bad guys*, with a Comparative sense, as in *Herb's the tallest from me*, and with a few other senses that do not occur in adult usage. C&C suggest that these facts point to an *emergent category*, which they call SOURCE, that subsumes the conventional senses of *from* and the child's novel uses, either as a superordinate category to them, a feature shared by all of them, or a feature of the Locative sense that is metaphorically extended to all the others.

I argue that learnability considerations, as well as empirical ones, suggest a different story. The syntactic novelty of certain early child uses of *from* makes them seem semantically novel as well. However, the situations described by these uses share a number of properties with those described by certain Locative uses. These properties are all potential aspects of the meaning associated with *from* by children, and some happen to correspond to adult senses of *from*. Perhaps, then, the novel uses and certain adult senses are based on a single conflated prototype.

If indeed the child first learns a conflated prototype as the meaning of *from*, it may be that the more physical aspects of the meaning—those corresponding to perceptible facts—assist the child in learning the more abstract aspects of meaning that are correlated with them. Such exploitation of correlations resembles *semantic bootstrapping* (see Grimshaw 1981, Pinker 1984), though the categories that the child learns as a result are semantic rather than syntactic ones. This learning strategy, based on correlations of potential semantic dimensions which are encoded as separate senses in adult language, conforms to the Subset Principle, because the resulting hypotheses about semantic representations are always extensionally more restricted than the target semantic representations. The implied learning strategy in C&C's proposal, on the other hand, does not conform to the Subset Principle.

2. Learnability theory

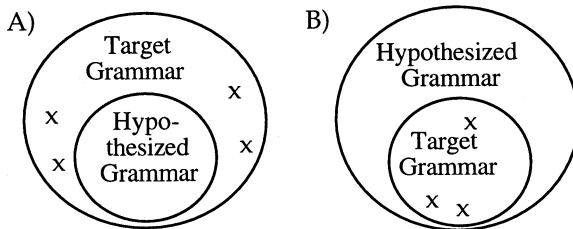
Many discussions of learnability focus on syntactic principles stated in terms of categories which are assumed to be innately specified by Universal Grammar. This paper, which is concerned with the acquisition of semantic representations, adopts a more general view of learnability theory like this one, expressed in Pinker 1989:

This approach [i.e. the learnability approach] focuses on the logical nature of the task facing the child as he or she tries to learn a language and on the mental representations and processes that make such learning successful. p. 1-2

Two ideas from learnability theory can be usefully applied to semantic acquisition. These are the *Subset Principle* and *semantic bootstrapping*.

2.1 The Subset Principle

This is a principle, discussed in Berwick 1985 and many subsequent works, about the optimal way to learn a grammar. It is inspired by the generally accepted observation that children do not rely heavily on negative evidence when learning a language—i.e., they are not explicitly told which sentences are ungrammatical. If this is true, it must be the case that the child's hypotheses are constrained in such a way that positive evidence—examples of grammatical sentences—will suffice to disprove them if they are wrong. This is guaranteed if the child always hypothesizes a grammar that is a subset of the target grammar, i.e. one that licenses a subset of the grammatical expressions of the target grammar (represented in A).



If this strategy is followed, then there are numerous expressions (represented by the x's in A) the child can hear which belong to the target grammar but not the hypothesized grammar, and each of these provides evidence that the hypothesized grammar must be modified. Compare this to the case where the child hypothesizes a superset of the target grammar (as in B). In this case there is no positive evidence that will disprove the child's hypothesis; every expression that the child encounters (represented by the x's in B) is in the hypothesized grammar as well as the target grammar and therefore does not help the child decide between them.

2.2 Semantic bootstrapping

Bootstrapping proposals (see Pinker 1984) address the question of how children are able to make generalizations about the relatively abstract categories (grammatical functions, lexical classes, etc.) that are relevant to grammatical principles. For example, in order to make generalizations about the possible linear position of the Subject of a sentence, a child must be able to recognize tokens of the category Subject. However, since Subjects are often not marked in any overt way, the child would seem to have to use the structural knowledge that he or she is trying to learn

in order to identify instances of the category. Such categories therefore pose a learning paradox, requiring children to "pull themselves up by their own bootstraps." Bootstrapping proposals offer possible solutions to this paradox.

The strategy of all bootstrapping proposals is to attribute to the child an assumed correlation between the relatively abstract grammatical category and another category which is less abstract. Since instances of the latter are easier to recognize, they may help the child recognize instances of the former. *Prosodic* bootstrapping proposals (see Pinker 1984) claim that grammatical categories are marked by prosodic features of the child's input. *Semantic* bootstrapping proposals claim that grammatical categories are assumed by the child to be correlated with semantic categories.

In the first explicit semantic bootstrapping proposal, Grimshaw (1981) suggests that children learn lexical classes by exploiting their canonical associations with general ontological categories like "object" and "action." She argues that an innately-specified language acquisition device (LAD) contains principles like the following: Assume any expression denoting an object is a noun, and any expression denoting an action is a verb. If the child follows such a strategy, he or she will be correct often enough to make useful initial observations and hypotheses about the true distributional definitions of these lexical categories. Grimshaw refers to this idea as *Canonical Structural Realization*.

As Berwick (1985) points out, bootstrapping guarantees a type of adherence to the Subset Principle. Whenever the child assumes a strict correlation between categories where in the adult language there is only a loose one, the child's grammar will be more restricted with respect to that correlation than the adult's grammar is. For example, consider the proposal that the grammatical function Subject is bootstrapped by the semantic/thematic category Agent, i.e., that the child assumes that any expression denoting an Agent must be a Subject. The grammar based on this hypothesis, which would have a unique mapping of the Agent role onto a particular means of expression, would, all else being equal, license a subset of the expressions that are licensed by adult English, which also allows oblique Agents in passives.

3. How does bootstrapping relate to semantic acquisition?

I argue that bootstrapping, understood as the exploitation by the learner of correlations between categories whose instances are accessible to different degrees, is relevant to the acquisition not only of syntactic categories, but also of relatively abstract semantic categories. That is, I argue for something that might be called *semantic bootstrapping of semantics*.

This presupposes that the task the child faces of mapping forms onto meanings is non-trivial (see Clark 1993, etc.). Following Bowerman 1993, I assume that the child often must attend to rather subtle aspects of the contexts in which forms are used in order to infer their meanings, and that the meanings of forms do not necessarily correspond to individual and clearly delineated conceptual categories that the child brings to the learning task. I do not summarize arguments for this position here, but I believe that the phenomena that I discuss offer support for it.

One thing that may complicate the mapping problem for the child is the correct *delimitation* of senses.² When a child hears a form used to describe a particular situation, the child may not know which aspects of the situation are expressed by it. If the situation belongs to a regularly recurring situation-type which frequently serves as a learning context for that form, the problem may become more general:

The child may not know which aspects of the situation-type to associate with the semantic representation of the form. Even if the child correctly recognizes some dimension(s) of a situation-type as relevant to a particular sense, she or he may not know which others are relevant, and may include too few or too many in the initial hypothesized representation of the sense.

Some learning tasks pose less of a delimitation problem than others. For example, the first words for physical objects learned by the child almost always refer to individual whole objects (Markman 1989). If the child operates under a *whole object constraint*, as Markman proposes, the delimitation of certain early noun senses can be attributed to the general perceptual and motor abilities that allow the child to individuate objects. For other kinds of meaning the matter is more complex, though. As Tomasello (1992) points out, "in the case of verbs it is much more uncertain what aspects of a situation are relevant for its meaning" (pp. 17-18).

Polysemy introduces another twist to the mapping problem which is closely related to delimitation. This is the problem of the *differentiation* of senses. Given a number of perhaps closely related senses associated with a single form in the child's input, how does the child tell them all apart? A failure to delimit a sense correctly might make it difficult for the child to distinguish that sense from others. In the next section we will see how the delimitation and differentiation problems may interact to create what I call a *conflated* representation. This type of representation, though incorrect from an adult point of view, may ultimately assist the child in learning the multiple senses of some polysemous forms through a process resembling semantic bootstrapping.

4. *See* and the semantic bootstrapping of semantics

To illustrate conflation, I will refer to data and analysis from previous work (Johnson to appear) on the acquisition of the polysemous verb *see*.

It has been assumed (e.g. in Lakoff & Johnson 1980, Sweetser 1990, Pinker 1994) that non-visual, mental uses of *see* such as *I see what you mean* are metaphorical. In Lakoff and Johnson 1980 and subsequent work in the same vein, a metaphorical sense like this is accounted for by a mapping from elements of one conceptual representation onto elements of a distinct representation belonging to a different conceptual domain. Lakoff and Johnson argue that correlations between phenomena in experience may serve as initial motivations for the child to construct mappings of this kind, but they do not discuss how such correlations might relate to the process of learning individual word senses.

In Johnson (to appear) I argue that correlations of phenomena in experience may figure more prominently in the learning of the mental sense of *see* than this metaphorical view has suggested. I argue that these correlations initially affect the mapping problem for the child. The result is that the child conflates what adults consider different senses of *see*. Ultimately, however, this conflation helps the child learn the appropriate non-visual sense. Data from Clark's Shem corpus, from the CHILDES archive (see MacWhinney 1995 and Clark 1982), provide support for this argument.

In the data, adult input does not consist mainly of "purely visual" uses of *see*. By far the most frequent uses of *see* to the child are demonstrative ones in which the child's attention is being called to some object or situation, e.g. *See, here's a bicycle*. On the basis of this we might hypothesize that the child associates *see* not just with vision in the limited sense but with situations in which vision results in becoming aware of things and situations.

In addition, adults use tokens of many use-types to the child, and the child produces tokens of most of these types, including those that are not typically visual for adults (e.g. *see* followed by a *wh*-complement). Yet the child's uses almost without exception describe situations that involve vision. This seems to indicate that what could be non-visual uses for adults are assimilated by the child to a prototypical meaning that involves vision. This is not unlikely, because many of the adult-to-child utterances of primarily non-visual use types exhibit a kind of ambiguity due to the activities that adults and children tend to do together and talk about. Consider the following examples of adult uses of *see* to the child:

- (1) can you **see** what's in here? (Showing child the little window on a tape-recorder)³
- (2) oh, I **see** what you wanted (In response to child's request to go get a toy)
- (3) [looking at a book together]
Adult: who's that?
Child: uh man(d)s taking uh purse to <uh> [/] back to the bunny # and taking uh purse xxx she's mad.
Adult: yeah I can **see** why.
- (4) now you push that and **see** what happens
- (5) (Child is looking out of the window at a little balcony opposite)
Child: yeah # yeah.
Adult: oh # I **see** where you wanna go # okay.
- (6) Adult: she's measuring him.
Child: yeah # measure +...
Adult: she's **seeing** how long he is.
- (7) Child: dat?
Adult: what is this thing?
Child: you put pennies in it # an(d) it goes like dat.
Adult: oh # maybe i have some pennies we can put in and **see** how it works.
- (8) (looking at a picture book):
Let's turn the page and **see** what happens.
- (9) (doorbell rings)
oh # let's **see** who's there.
- (10) Adult: well # do you want this to close or to open?
Child: tape it to there # right there.
Adult: oh # i **see** what you mean! So you want this to go like this.
Child: yeah # dat's <right> [?].
- (11) Adult: but if you take that tape off # then the top will fall apart # it won't be like a little roof anymore # **see** what i mean?
Child: dere # it stays together.

These utterances, representative of adult-to-child uses of *see* + *wh*-complement in the Shem corpus, exhibit an ambiguity similar to the kind Benveniste (1966), Traugott (1988) and others have argued can lead to historical semantic change.⁴ The meaning of each one in context can be described in two ways, one of which makes reference to a visual experience and the other of which does not. E.g., (1) might mean 'Can you see the object that is in here?' or 'Can you tell what is in here?', and

(8) might mean 'Let's turn the page and see the next picture in the story,' or 'Let's turn the page and find out what happens.' Though (10) involves one of the parade examples of a metaphorical use of *see* (*I see what you mean*), it fits in with this pattern. It could mean 'I see what you are demonstrating to me' or 'I now understand what you are trying to tell me.' From an adult point of view we know that these "paraphrases" are not semantically equivalent, but there seems to be little reason why the child would need to distinguish the possible interpretations.

These data suggest the following analysis. Given the strong correlation between visual experience and the achievement and maintenance of states of awareness, and given the preponderance in the adult's speech of demonstrative uses, which highlight this correlation, it is very likely that the child does not delimit the meaning of *see* the way adults do.⁵ That is, it seems unlikely that the child believes that *see* only indicates the more physical part of visual experiences and not the attendant mental dimension, which typically involves a change in awareness or knowledge. If it is true that the problem of delimitation comes up in this way, it is also likely that the child does not recognize uses like (11) as exemplifying a distinct sense of *see*. Since almost all the child's uses of *see* are anchored in situations involving vision, but these uses include some that would seem to belong to primarily non-visual use types (e.g. *turn on and see how works*), it seems very likely that the child assimilates different adult uses of *see* to a single meaning that involves vision as well as the mental experience that goes along with it. That is, I believe that the delimitation and differentiation problems lead the child to have a conflated representation—one that subsumes use-types that are distinct for adults.

Under this view, the relation between the visual and mental senses of *see* in adult language is similar to the relation between the two uses of *climb* illustrated by the sentences *Kim climbed out on the ledge* and *The airplane climbed to 5000 feet* (see Fillmore 1982). In the first sentence *climb* refers to clambering with no upward motion, while in the second it refers to upward motion with no clambering. These are related by a prototypical use in which both dimensions are present. The polysemy structure of *see* may therefore be thought of as a special kind of *radial category* (see Lakoff 1987). What makes it special is the fact that the prototypical use is more strongly associated with child language than with adult language.

Of course, equally compatible with the data above is the hypothesis that the child has learned a meaning of *see* that is identical to the "literal" adult meaning, and mistakenly attributes this meaning to uses like *Let's see how it works*. While this may seem to be the simpler hypothesis, it does not address the issue of how the child learns the non-visual meaning. When this question is taken seriously, I believe that learnability considerations support the perhaps less intuitive hypothesis that the child starts with a conflated representation. Under this hypothesis we may predict that visual experience helps the child acquire the non-visual, mental sense of *see*. This is because the experiences that exemplify vision for the child, and that are associated with the form *see*, also exemplify changes in awareness and knowledge. That is, in many cases the child is being ostensibly taught the mental meaning by reference to visual situations. It would be more difficult for the child to learn the mental meaning in isolation, because mental experiences as such are not as easy for adults to identify and refer to for the child.

On this account, the visual meaning of *see* is used to "bootstrap" the mental meaning. The parallels to the bootstrapping of syntax are quite strong. In both cases there is a relatively abstract category that needs to be associated with a form in the child's input. This task is simplified by a correlation between the abstract category

and another one, associated with the same form, that is less abstract and whose instances are therefore easier to identify.⁶

5. The acquisition of *from*

Let us consider the possible role of correlations in the acquisition of non-spatial senses of *from*, including the temporary acquisition of novel uses by the child. Recall some of the uses discussed by C&C, not all of which correspond to conventional adult senses in English:

Location

e.g., *I'll get something from my Lego box*

Time

e.g., *back from fishing*

Agent (child only)

e.g., *He isn't going to get hurt from those bad guy*

Cause

e.g., *Who gets sick from eating seeds?*

Possessor (child only)

e.g., *That's a finger from him*

Standard of Comparison (child only)

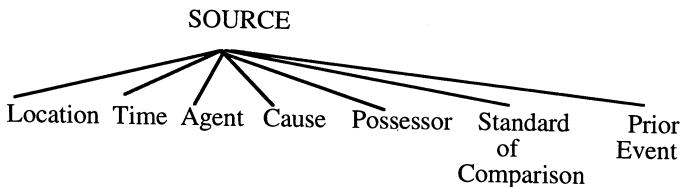
e.g., *This ear is longer from the other ear*

Prior Event

e.g., *They prevented the dogs from getting out*

C&C observe tendencies in the order in which children acquire these uses of *from*. Most notably, the Locative use always precedes all the other uses.

C&C suggest that there is a single category, which they call SOURCE, that relates all the other categories. They suggest three views of how the category SOURCE might be represented. One view, which they call the *taxonomic view*, treats SOURCE as a category with all the other more specific categories subordinate to it:



Another view, which they call the *property view*, treats SOURCE as a property that all the more specific categories have in common. This might be represented by making SOURCE a feature in a decomposition of each of the more specific categories, e.g.,

Location = (+ SOURCE, + SPATIAL, etc.)

Time = (+ SOURCE, + TEMPORAL, etc.)

Agent = (+ SOURCE, + ANIMATE, etc.)

etc.

Yet another view is the *metaphorical view*. Like the property view, this view treats SOURCE as a property of the Locative use. In this view, however, SOURCE is not shared by all the other uses, but is metaphorically extended to them.

6. Learnability and Damon's data

Let's consider how learning might work with C&C's taxonomic and property proposals. Suppose the child first associates *from* with Location. When the child encounters a Cause use of *from*, one of two things might happen. The child might correctly recognize that the utterance describes a situation exemplifying Cause as well as a number of other concepts, and notice that Causes and Locations are both types of SOURCE (or that they both have the feature + SOURCE). This perceived similarity between Cause and Location, which is already associated with *from*, might help the child identify the former as the correct meaning to associate with *from* in this use.

The problem with this scenario is that it provides no explanation for why the Location use of *from* should be learned first. If Causes are transparently recognizable as such, we might predict that Cause uses of *from* are learned as early as Location uses, which they are not.

The other thing that might happen when the child encounters a Cause use of *from* is this: He or she does not recognize the situation as exemplifying Cause, but tries to infer the meaning from the Location sense of *from*. In this case the child might conclude that the meaning is subsumed under the superordinate category SOURCE, but would have no evidence for which of the more specific SOURCE categories it was. Here the Subset Principle comes into play: Extensionally the meaning SOURCE is a superset of all the other categories (Location, Agent, etc.). If the child hypothesizes this general category as the meaning of *from*, then the contexts of the specific uses will not be of much help in deciding on a more specific meaning, since they all exemplify SOURCE.

The problem with the taxonomic and property views, then, is that they treat SOURCE as an abstract category to which the other categories belong. The metaphorical view, as C&C describe it, does not explain *why* the property SOURCE is metaphorically extended from the Locative sense to the other senses.

I argue against the idea that all the senses of *from* listed above are related by a single abstract category SOURCE. Instead I argue that the Location, Agent and Cause uses are related the same way the visual and non-visual senses of *see* are, i.e., by being exemplified together in the child's learning contexts. This understanding of the relation between these senses of *from* gives the child a learning advantage in the acquisition of the Cause use. Other uses, such as the Temporal and Comparative ones, seem to have different probable acquisitional explanations that will not be discussed here.⁷

The first novel uses of Damon, as reported in C&C, offer evidence that the Location use may bootstrap the Cause use, with the Agent use as a kind of intermediate stage the child goes through.

Damon's first novel use mentioned in C&C, from age 2;2,3, is *These fall down from me*, uttered after he had pushed some pieces of sandwich off a plate. C&C code this as an Agentive use, but notice that it could be coded as either a Location use or as a Cause use. Physically the sandwich moved away from Damon (or at least from Damon's hand), Damon was the Cause of it moving and falling, and Damon was an Agent. This use is evidence for a prototype representation that conflates the three semantic dimensions in question. At age 2;5,10 Damon said

They scared from me after he had rushed at some birds and they had, presumably, flown away. Again, this is coded by C&C as an Agentive use, but it could be coded as a Location use or as a Cause use. These uses, though novel, have the same potential semantic dimensions as uses of *from* involving transfer of an object from a person (e.g. *I got this from Mommy*). We might hypothesize that Damon's uses of *from* at this stage are based on such prototypical uses, with the clause nucleus expressing a resultant state, and the PP headed by *from* expressing something that is a Location (i.e. an origin of motion), a Cause and an Agent.

At 2;7,11 Damon said *he isn't going to get hurt from those bad guys*, in which the *from* phrase expresses something that is a Cause and an Agent but not a Location in any direct or literal sense. At 2;8,3 Damon utters *That's from I put a thing on it*, and at age 2;10,23 he utters *If I talk too much, I be tired from doing that*, which resembles the adult Cause use of *from*. In these uses *from* marks a Cause that is neither an Agent nor a Location.

The following table summarizes these observations about Damon's early novel uses of *from*:

age	child utterance	semantic dimensions
2;2,3	<i>This fall down from me</i>	Location, Agent, Cause
2;5,10	<i>They scared from me</i>	Location, Agent, Cause
2;7,11	<i>He isn't going to get hurt from those bad guys</i>	Agent, Cause
2;8,3	<i>That's from I put a thing on it</i>	Cause
2;10,23	<i>I be tired from doing that</i>	Cause

The sequence of Damon's early novel utterances suggests that he begins with a meaning of *from* that includes the semantic dimensions Location, Agent and Cause. This meaning may then be altered in the following way: When Damon encounters a use of *from* in which one of the dimensions is clearly missing, he assumes that the other dimensions are still present. For example, *You got this from Grandma*, uttered when Grandma is not present and there is no perceptible motion of the object in question, may lead the child to conclude that there is a use of *from* for which only the Agent and Cause dimensions are relevant. At this stage, a use like *I have a headache from the noise* could lead the child to infer that there is a use for which the Agent dimension is not relevant but the Cause dimension is.

This account of Damon's acquisition of the Cause sense of *from*, in which it is bootstrapped by prototypical uses of the Location sense, better matches the optimal learning strategy represented by the Subset Principle than do any of the representations proposed by C&C. Since the proposed prototype meaning contains the three semantic dimensions of Location, Agent and Cause, it is more specific than any of the individual concepts. That is, it is extensionally a subset of the target meaning (Cause). Under this account, the adult Cause use of *from* can be derived in a straightforward way from the proposed prototypical use of *from* on the basis of positive evidence.

7. What sort of thing is a “conflated” meaning?

Though it appears that the labels “Location,” “Agent,” etc. are being used above as semantic features, I don’t quite intend them that way. They are meant to stand for target senses that are *exemplified* by particular situation types. That is, the lists of labels next to Damon’s first novel uses are meant to stand for representations of experience-types that exemplify those notions, not for Damon’s actual concepts. What is important is the idea that multiple target senses can be exemplified by the same experience-type, though the experience-type may have a unity for the child that makes it more basic than the senses that it gives rise to.

This characterization of the early meaning of *from* as something relatively undifferentiated from which adult senses emerge resembles Slobin’s (1985) claim that children first associate grammatical functors with prototypical scenes that are unanalyzed relative to the eventual meanings associated with those functors in adult language. It differs from Slobin’s proposal in two ways, though. First, it claims that multiple senses may emerge from the same prototypical scene, and that this is in fact an acquisitional source of polysemy. Second, it accounts for the acquisition of *from* in terms of a phenomenon that is not limited to grammatical functors, since it is also argued to underlie the acquisition of the lexical verb *see*. Therefore the general proposal made here is in line with more recent work by Slobin (in press) in which he expresses doubts about the primitive distinction between grammatical and lexical items in acquisition.

It may be that the conflated meanings proposed above reflect early stages of the child’s conceptual development. In this case they would reflect *undifferentiated concepts* as discussed in Smith, Carey and Wiser 1985. The development of the distinct adult senses might then depend upon the emergence of theories of the appropriate domains (see Carey 1985, Keil 1989). For example, the achievement of the “literal” visual meaning of *see* might depend upon the emergence of a general theory of perception, which would require the child to generalize over the different sense modalities.

This work also relates to Ervin and Foster 1960, where it is argued that “what remains as a metaphorical, connotative relationship in adults may in many cases start as denotative non-differentiation” (p. 275). However, they focus on children’s interchangeable use of terms for highly correlated attributes, and claim that relatively perceptible attributes are less likely to be confused with others than are less easily-identified ones. The claim made here is that children exploit salient and perceptible aspects of experiences associated with linguistic forms in order to identify instances of more abstract categories for the purpose of learning.

8. Conclusion

I have argued that children use a strategy resembling semantic bootstrapping to learn the relatively abstract senses of some polysemous forms. This strategy exploits the correlations, adhering in prototypical uses of those forms, between more perceptible, intersubjective aspects of experience and more abstract, subjective ones in order to associate the latter with the forms. Evidence for this strategy comes from patterns of adult input and child production. In addition, the viability of the strategy is supported by theoretical considerations of learnability. Possible alternative accounts of the acquisition of the senses discussed here either fail to predict the order in which the senses are learned, or are less sound from a learnability point-of-view.

The proposed parallel between bootstrapping and semantic acquisition has important theoretical implications. Bootstrapping proposals are designed to address the problem of how children break into a system of purely formal categories. Typically it is assumed that these categories are innate, but that children are unable to recognize instances of them in their experience. However, the semantic categories whose acquisition is discussed here are not assumed to be innate. Rather, the proposed strategy provides a way for the child to identify classes of experience to serve as the basis for the construction of the categories. An interesting direction for future research will be to examine the relevance of this approach to work that attempts to recast semantic bootstrapping proposals so that they do not make reference to innate syntactic categories (e.g. Schlesinger 1988, Braine 1992).

Notes

- ¹ In this paper the terms "Location" and "Locative" are applied, as in C&C's paper, to all uses of *from* that describe spatial origins of motion.
- ² I believe this is what Tomasello (1992) refers to as the "packaging problem" (p. 17).
- ³ Comments in parentheses are from the transcriber. Comments in brackets are my own.
- ⁴ The ambiguity corresponds roughly to the possibility of either a headless relative or an embedded interrogative reading of the *wh*-complement. This observation, though intriguing, will not be pursued in this paper.
- ⁵ It has been argued (Goldberg 1990) that even the adult visual use of *see* usually involves a mental dimension. The truth of this claim would not change my argument—in fact, it would provide additional evidence for it.
- ⁶ An additional parallel is the asymmetry of the correlation. Vision implies mental experience while the reverse is not true. In bootstrapping, a semantic category implies a syntactic category, while the reverse need not be true.
- ⁷ The child's novel Comparative use, e.g. *Herb's the tallest from me*, is probably based on adult uses like *They are different from you*, which C&C mention. The child may assume *from* is a general Comparative marker when exposed to such sentences, and only later learn that it is idiosyncratically selected by *different* in this context.

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